

Amendments to the Claims

This listing of claims will replace all prior version and listings of claims in the application:

Listing of Claims:

1-25. (Canceled).

26-30 (Withdrawn).

31-50. (Canceled).

51. (Amended) A method for producing a nuclear transfer unit having genomic DNA of one ungulate **animal** [species] and mitochondria of a different ungulate **animal** [species], comprising:

- (i) enucleating an ungulate oocyte;
- (ii) inserting a differentiated ungulate donor cell, or the nucleus of said cell, into the oocyte under conditions suitable for the formation of a nuclear transfer unit so that a nuclear transfer unit is formed, wherein said oocyte and said differentiated cell are from different ungulate species;
- (iii) activating the resultant nuclear transfer unit; and
- (iv) culturing the activated nuclear transfer unit to produce a multicellular structure;

wherein said multicellular nuclear transfer unit develops into an ungulate animal having genomic DNA of one ungulate animal [species] and mitochondria of a different ungulate animal [species] upon being transferred into a female animal of the same species as the oocyte, **and wherein the ungulate animal is a bovine, ovine, porcine, equines, caprines, or buffalo.**

52. (Previously Presented) The method of claim 51, wherein step (ii) further comprises fusing the differentiated cell and the oocyte.

53. (Previously Presented) The method of claim 52, wherein fusion is effected by electrofusion.

54. (Previously Presented) The method of claim 51, wherein the step of activating the nuclear transfer unit comprises exposing said nuclear transfer unit to an ionophore.

55. (Previously Presented) The method of claim 51, wherein said differentiated donor cell is a non-embryonic cell.

56. (Previously Presented) The method of claim 51, wherein the differentiated donor cell is a germ cell.

57. (Previously Presented) The method of claim 51, wherein the differentiated donor cell is a somatic cell.

58. (Previously Presented) The method of claim 51, wherein the differentiated donor cell is selected from the group consisting of epithelial cells, neural cells, epidermal cells, keratinocytes, hematopoietic cells, melanocytes, chondrocytes, B lymphocytes, T lymphocytes, erythrocytes, macrophages, monocytes, mononuclear cells, fibroblasts, and muscle cells.

59. (Previously Presented) The method of claim 51, wherein the differentiated donor cell is from an organ selected from the group consisting of skin, lung, pancreas, liver, stomach, intestine, heart, reproductive organs, bladder, kidney, urethra, and other urinary organs.

60. (Previously Presented) The method of claim 51, wherein the differentiated donor cell is a fibroblast.

61. (Previously Presented) The method of claim 51 wherein the differentiated donor cell and the recipient oocyte are from ungulate animals of the same subfamily.

62. (Previously Presented) The method of claim 61 wherein the differentiated donor cell and the recipient oocyte are from bovine animals.

63. (Cancelled)

64. (Cancelled)

65. (Cancelled)

66. (Amended) The method of claim 51 [~~65~~], wherein the oocyte is from *Bos taurus*.

67-68. (Canceled).

69. (Previously Presented) The method of claim 62, wherein the differentiated donor cell is from *Bos gaurus* and the oocyte is from *Bos taurus*.

70. (Previously Presented) The method of claim 51, comprising culturing said activated nuclear transfer unit on a feeder layer of fibroblast cells to produce a multicellular structure.

71. (Previously Presented) The method of claim 51, further comprising isolating an embryonic cell from the multicellular structure produced by the cultured nuclear transfer unit.

72. (Previously Presented) The method of claim 71, wherein the embryonic cell is isolated from a multicellular structure of about 2 to 400 cells.

73. (Previously Presented) The method of claim 51, further comprising culturing said activated nuclear transfer unit to produce a blastocyst.

74. (Previously Presented) The method of claim 73, further comprising isolating embryonic cells from the blastocyst.

75. (Previously Presented) The method of claim 74, further comprising culturing an embryonic cell isolated from the blastocyst, and producing a cell line from said embryonic cell.

76. (Previously Presented) The method of claim 51, wherein the genome of the differentiated donor cell is genetically altered by addition, modification, substitution, or deletion of one or more genes.

77. (Previously Presented) The method of claim 76, wherein the genome of the donor cell is genetically altered by a method comprising homologous recombination.

78. (Previously Presented) The method of claim 76, wherein the genome of the differentiated donor cell is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

79. (Amended) An isolated [~~embryonic~~] cell produced by the method of claim 71, which cell is not itself an embryo.

80. (Amended) The isolated [~~embryonic~~] cell of claim 79, which cell has genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

81. (Amended) The isolated [~~embryonic~~] cell of claim 80, which cell has bovine genomic DNA and bovine mitochondria.

82. (Amended) The isolated [~~embryonic~~] cell of claim 81, which cell has genomic DNA of *Bos gaurus* and mitochondria of *Bos taurus*.

83. (Amended) An isolated [~~embryonic~~] cell which is not itself an embryo, which cell has genomic DNA of one ungulate animal [~~species~~] and mitochondria of a different ungulate animal [~~species~~].

84. (Amended) The isolated [~~embryonic~~] cell of claim 83, which cell has genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

85. (Amended) The isolated [~~embryonic~~] cell of claim 84, which cell has bovine genomic DNA and bovine mitochondria.

86. (Amended) A method for producing a nuclear transfer unit having genetically altered genomic DNA of one ungulate animal [~~species~~] and mitochondria of a different ungulate animal [~~species~~], comprising:

- (i) obtaining a differentiated ungulate donor cell, the genome of which is genetically altered by addition, modification, substitution, or deletion of one or more genes;
- (ii) enucleating an ungulate oocyte;
- (iii) inserting the genetically altered donor cell, or the nucleus of said cell, into the oocyte under conditions suitable for the formation of a nuclear transfer unit so that a nuclear transfer unit is formed, wherein said oocyte and said differentiated donor cell are from different [~~ungulate~~] species;
- (iv) activating the resultant nuclear transfer unit; and
- (v) culturing the activated nuclear transfer unit to produce a multicellular structure;

wherein said multicellular nuclear transfer unit develops into an ungulate animal having genetically altered genomic DNA of one ungulate animal [species] and mitochondria of a different ungulate animal [species] upon being transferred into female animal of the same species as the oocyte, wherein the ungulate animal a bovine, ovine, porcine, equine, caprine, or buffalo.

87. (Previously Presented) The method of claim 86, wherein the genome of the donor cell is genetically altered by a method comprising homologous recombination.

88. (Previously Presented) The method of claim 86, wherein the genome of the donor cell is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

89. (Previously Presented) The method of claim 86, wherein fusion is effected by electrofusion.

90. (Previously Presented) The method of claim 86, wherein the step of activating the nuclear transfer unit comprises exposing said nuclear transfer unit to an ionophore.

91. (Previously Presented) The method of claim 86, wherein the differentiated donor cell is a non-embryonic cell.

92. (Previously Presented) The method of claim 86 wherein the differentiated donor cell is a germ cell.

93. (Previously Presented) The method of Claim 86, wherein the differentiated donor cell is a somatic cell.

94. (Previously Presented) The method of claim 86, wherein the differentiated donor cell is selected from the group consisting of epithelial cells, neural cells, epidermal cells, keratinocytes, hematopoietic cells, melanocytes, chondrocytes, B lymphocytes, T lymphocytes, erythrocytes, macrophages, monocytes, mononuclear cells, fibroblasts, and muscle cells.

95. (Previously Presented) The method of claim 86, wherein the differentiated donor cell is from an organ selected from the group consisting of skin, lung, pancreas, liver, stomach, intestine, heart, reproductive organs, bladder, kidney, urethra, and other urinary organs.

96. (Previously Presented) The method of claim 86 wherein the differentiated donor cell is a fibroblast.

97. (Previously Presented) The method of claim 86 wherein the differentiated donor cell and the recipient oocyte are from ungulate animals of the same subfamily.

98. (Previously Presented) The method of claim 97 wherein the differentiated donor cell and the recipient oocyte are from bovine animals.

99. (Cancelled)

100. (Cancelled)

101. (Amended) The method of claim 97 [~~100~~], wherein the oocyte is from a bovine.

102. (Previously Presented) The method of claim 102, wherein the oocyte is from *Bos taurus*.
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103-104. (Canceled).

105. (Previously Presented) The method of claim 98, wherein the differentiated donor cell is from *Bos gaurus* and the oocyte is from *Bos taurus*.

106. (Previously Presented) The method of claim 86, comprising culturing said activated nuclear transfer unit on a feeder layer of fibroblast cells to produce a multicellular structure.

107. (Previously Presented) The method of claim 86, further comprising isolating an embryonic cell from the multicellular structure produced by the cultured nuclear transfer unit.

108. (Previously Presented) The method of claim 107, wherein the embryonic cell is isolated from a multicellular structure of about 2 to 400 cells.

109. (Previously Presented) The method of claim 86, further comprising culturing said activated nuclear transfer unit to produce a blastocyst.

110. (Amended) The method of claim 109, further comprising isolating [embryonic] cells from the blastocyst.

111. (Amended) The method of claim 110, further comprising culturing a [embryonic] cell having a genetically altered genome isolated from the blastocyst, and producing a cell line from said [embryonic] cell.

112. (Previously Presented) An isolated cell having genetically altered genomic DNA produced by the method of claim 107, which cell is not itself an embryo.

113. (Previously Presented) The isolated cell of claim 112, which cell has genetically altered genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

114. (Previously Presented) The isolated cell of claim 113, which cell has genetically altered bovine genomic DNA and bovine mitochondria.

115. (Previously Presented) The isolated cell of claim 114, which cell has genetically altered genomic DNA of *Bos gaurus* and mitochondria of *Bos taurus*.

116. (Previously Presented) The isolated cell of claim 112, the genome of which is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

117. (Amended) An isolated [~~embryonic~~] cell which is not itself an embryo, which cell has genetically altered genomic DNA of one ungulate species and mitochondria of a different ungulate species.

118. (Amended) The isolated [~~embryonic~~] cell of claim 117, which cell has genetically altered genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

119. (Amended) The isolated [~~embryonic~~] cell of claim 118, which cell has genetically altered bovine genomic DNA and bovine mitochondria.

120. (Amended) The isolated [~~embryonic~~] cell of claim 117, the genome of which is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

121. A cell of the cell line produced by the method of claim 75.

122. (Previously Presented) The cell of claim 121, which cell has genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

123. (Previously Presented) The cell of claim 122, which cell has bovine genomic DNA and bovine mitochondria.

124. (Previously Presented) The cell of claim 123, which cell has genomic DNA of *Bos gaurus* and mitochondria of *Bos taurus*.

125. (Previously Presented) The method of claim 75, further comprising genetically altering the genomic DNA of a cell of said cell line by adding, modifying, substituting, or deleting one or more genes.

126. (Previously Presented) The method of claim 125, wherein the genome of said cell is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

127. (Previously Presented) The method of claim 125, wherein the genome of said cell is genetically altered by a method comprising homologous recombination.

128. (Previously Presented) A cell having genetically altered genomic DNA produced by the method of claim 125.

129. (Previously Presented) The cell of claim 128, which cell has genetically altered genomic DNA of a first ungulate animal and mitochondria of a second ungulate animal that is of the same subfamily as the first ungulate animal.

130. (Previously Presented) The cell of claim 129, which cell has genetically altered bovine genomic DNA and bovine mitochondria.

130. (Previously Presented) The cell of claim 128, which cell has genetically altered, human genomic DNA and bovine mitochondria.

131. (Previously Presented) The cell of claim 130, which cell has genetically altered genomic DNA of *Bos gaurus* and mitochondria of *Bos taurus*.

132. (Previously Presented) The cell of claim 128, the genome of which is genetically altered by addition, modification, substitution, or deletion of one or more genes that encode an enzyme, a growth factor, or a cytokine.

133. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 51.

134. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 61.

135. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 62.

136. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 63.

137. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 65.

138. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 66.

139. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 69.

140. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 86.

141. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 97.

142. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 98.

143. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 99.

144. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 101.

145. (Previously Presented) An ungulate animal developed from a nuclear transfer unit produced by the method of claim 102.

146. (Previously Presented) A bovine animal developed from a nuclear transfer unit produced by the method of claim 105.